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TWO NEW SPECIES OF MEXICAN PLETHODONTID
SALAMANDERS.

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Of the two species described here one was obtained from a locality near Galeana, Nuevo León, by Mr. Radclyffe Roberts in 1938, and presented to me. Certain other specimens were obtained by Dr. Hobart M. Smith in 1939, in the same general locality. The second species was obtained independently by Dr. Smith and myself in 1940. These specimens are from a locality about twenty miles north of Totalco, in the mountains which lie between Perote and Tezuitlán in Veracruz.

***Bolitoglossa melanomolga*, sp. nov.**

Type.—EHT-HMS No. 24626, about 20 km. north of San Antonio Limón (Totalco), Veracruz, June 24, 1940, Richard C. Taylor and Edward H. Taylor, Colls.

Paratypes.—U. S. N. M. Nos. 110641, Topotype, E. H. Taylor Coll., 110640, 17 kms. N. E. Limón, Mar. 23, 1940, Hobart M. Smith Coll.

Diagnosis.—A member of the *Bolitoglossa bellii* group, most closely related to *B. gadovii* (Dunn) but differing in being black with a paired series of light spots on back and a few spots scattered on sides; the limbs longer, touching or overlapping when adpressed with more elongate digits. The interorbital width is less, the width of an eyelid greater; axilla to groin distance less, and larger series of maxillary-premaxillary, vomerine, and mandibular teeth. Toes with web not extending but slightly beyond metacarpals and metatarsals; 11 costal grooves; a sublingual fold; parasphenoid teeth in two series.

Description of the type.—A rather large salamander; the length, snout to anterior edge of vent, 72 mm.; head large, not or scarcely wider than neck; eye large, prominent, its length (4.8 mm.) greater than the length of the snout (4 mm.); width of head (11.4 mm.) contained in head-body length (72 mm.) 6.3 times; head length to gular fold (18.5 mm.) contained 3.89 times; distance between orbits (2.7 mm.) less than width of an eyelid (3.4 mm.); nostril small, its groove forming a right angle; subnarial swell-

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ings scarcely discernible; posterior part of eyelids inserted under a well-defined fold; occipital region very slightly raised, lacking a trace of a medial depression; no canthus rostralis; slight transverse gular fold, the groove arising on each side can be traced on sides of neck to the middorsal line; none or only a faint trace of a groove crossing jaw angle (it can not be discerned on throat); a groove from behind upper part of eye runs back and joins the end of the gular fold; head with moderately large pits; remainder of body very smooth and shiny, the pits very tiny; groove below eye terminates above lip; line of mouth almost straight, diagonal; when arm is brought forward it reaches anterior corner of eye; pads on tips of digits thickened, prominent; digits not widened; order of length in fingers, 1, 3, 2, 4; of toes, 1, 5, 2, 4, 3; when limbs are adpressed they overlap about $1\frac{1}{2}$ folds; a slight glandular area posterior to insertion of femur; depth of body a little less than width; 11 distinct costal grooves with no trace of the axillary or inguinal; tail missing (the wound scarcely healed); cloaca with the walls folded; skin between costal grooves not folded or puckered.

Tongue boletoid, relatively large; a semicircular sublingual fold; maxillary-premaxillary teeth, 32-34; vomerine teeth 14-15, the two series separated medially by a space equal to that between two teeth, the two series not maintaining the same level but forming an angular arch (in *gadovii*, outer and inner part of tooth series maintains the same elevation across palate); mandibular teeth 28-30; parasphenoid teeth in two rather narrow series, widely separated posteriorly, more or less contiguous anteriorly; separated from the vomerine teeth by a distance half of that between the large choanae; diameter of choana (.65) is contained about 4.4 times in distance between choanae (2.9 mm.).

Color in life.—Above purplish-black, somewhat lighter on the ventral surfaces; paired whitish flecks dorsally on each costal fold, anteriorly diagonal but posteriorly they have the form of parallel dashes which are separated by a distance equalling their combined length; a few scattered flecks on sides; a rather prominent fleck on the lateral ends of the gular fold; a few minute light flecks on chin; a white line follows the gular fold across the throat; the costal grooves are more or less whitish; under surface of digits light.

Measurements in mm.—(Of *Bolitoglossa melanomolga* Nos. 110641 yg. and 24626, type; and two topotypic *Bolitoglossa gadovii*.) (Sex (yg), ♀, ♀, ♀; snout to anterior end of vent, 33, 72, 73, 71; tail, 20, ?, 80, 71; snout to gular fold, 9.5, 18.5, 18.5, 17.8; snout to foreleg, 11.3, 24.7, 23.3, 23; length of snout, 2.1, 4, 4.1, 4; width of head, 6.8, 11.4, 11, 10.2; inter-orbital width 2, 2.7, 3.2, 2.8; eyelid, 2, 3.4, 3, 2.9; arm, 9.5, 20.5, 17.2, 16; leg, 10, 22.2, 20, 20; axilla to groin, 16.5, 37.5, 41.5, 40. The counts of maxillary-premaxillary teeth for the same series are, ?, 32-34, 28-24, 23-21; vomerine teeth, ?, 14-15, 7-8, 8-9; mandibular teeth, ?, 28-30, 24-24, 23-23 (in the young specimen the teeth have scarcely penetrated the gums).

Variation.—The paratypes agree very well, save that they are very young. They are dark and the backs are spotted as in the type. In the

young, the tail length is less than head and body, but this is probably due to its age. In older specimens it is probable that the tail would equal or exceed the length from snout to vent.

Remarks.—Topotypic *Bolitoglossa gadovii*, from Mt. Orizaba (Citlaltepetl), are lavender above; all ventral surfaces and lower half of the sides of body and tail are yellow or cream. Specimens taken from Mt. Malinche (Malintzin) have a similar coloration. The species seems to be absent on Cofre de Perote, the high mountain lying to the southeast, and nearer to the type locality of the newly described species than are the other two mountains.

Bolitoglossa melanomolga is a member of the *bellii* group of the genus, but within the group it is a member of a subgroup which includes *B. smithi*, *B. unguidentis*, and *B. gadovii*. In these, the premaxillary teeth of the males are curiously bifid, the posterior part forming a rounded knob, the anterior part, a hooked claw. It is presumed that the males of the present form will show a similar modification. The three above mentioned species have the skull curiously elevated above the otic capsule in the adult. In *smithi*, the limbs are shorter, and when adpressed are separated by $3\frac{1}{2}$ to 4 costal folds. In *unguidentis* the width of head is contained in snout to vent length about 7 times. In this species the limbs are large, well-developed, touching when adpressed; the maxillary and mandibular teeth are fewer than in *smithi*.

The elevation of the type locality is between 7,000 and 8,000 ft. All three of the specimens were taken from under rocks in a pine forest.

***Bolitoglossa galaenae*, sp. nov.**

Type.—EHT-HMS No. 17146. Collected near Galaena, N. L., 7,000 ft. elevation July 10, 1938, by Radclyffe Roberts.

Paratypes.—EHT-HMS No. 17145, topotype; collector Radclyffe Roberts; EHT-HMS Nos. 25762–25763, and USNM Nos. 110642–110658, Galeana, N. L., elevation 5,200 ft., H. M. Smith Coll.

Diagnosis.—A member of the *bellii* group of *Bolitoglossa*, more closely related to a subgroup including *cephalica* and *manni*. Differentiated from these two species in being considerably larger (maximum length from snout to anterior end of vent, 70 mm.; vent, 5 mm.) and with (usually) large white spots on tail (occasionally also on body); pads of the tip of toes better developed, while the narial swellings and submental gland are reduced; more numerous teeth in full grown adults; maxillary-premaxillary, 59–59; vomerine, 20–18; mandibular, 64–66.

Description of type.—A rather large salamander with a snout to anterior end of vent measurement of 70 mm.; head large, wider than neck or body; eye moderately large, prominent, its length (3.9 mm.) less than length of snout (4.3 mm.); width of head (11.5 mm.) contained in the head body length 6 times; head length to gular fold (17 mm.) contained in same distance 4.1 times; distance between orbits (3.6 mm.) greater than the width of an eyelid (2.7 mm.); nostril small, the groove runs straight down from the posterior edge; subnarial swellings (♀) small but distinct; pos-

terior edges of eyelids inserted under a diagonal fold; no canthus; head generally flat, the occipital region not, or but slightly, raised; the grooves arising from sides of the gular fold vertical, but these can not be traced to middorsal line; a groove by the angle of jaw can be traced across throat, and dorsally the groove is more or less distinct to middorsal line; the groove behind eye very indistinct anteriorly, but is more evident where it joins the gular groove; skin on dorsal surfaces smooth, shiny, the pits small; groove under eye not distinct; line of mouth forming a straight diagonal line anteriorly, and a slight curved arch posteriorly; arm brought forward, the fingers reach to middle of eye; rounded pads of tips of digits well defined; digits flattened, webbed at base, the web including all of the proximal phalanges; the first finger with tip emergent from web; the fourth has about half of distal phalanx free; order of length of fingers, 1, 4, 2, 3; of toes, 1, 5, 2, 3=4; web between toes does not include completely the proximal phalanx; adpressed limbs separated by two costal folds; a distinct glandular spot behind insertion of femur; depth of body less than its width; 13 costal grooves, the inguinal and axillary scarcely distinguishable, the skin between the costal grooves longitudinally folded or puckered; tail shorter than body; about 23 grooves on tail. Tongue boletoid, of average size; a sublingual fold; maxillary-premaxillary teeth 58-60; vomerine teeth in transverse curves, 18-20, separated medially by a distance equal to the diameter of a choana, the series extending about two-fifths of their length beyond (lateral) choanae; parasphenoid teeth in two more or less parallel series, 86-83, the series not in contact anteriorly, separated from the vomerine teeth by about a fourth of the distance between choanae; choanae small; mandibular teeth, 64-66; diameter of choana contained in distance between choana about 6 times.

Color.—Body slaty to purplish black; a few rather large scattered irregular white spots; the ventral surfaces are only a shade lighter than the dorsal; chin a little lighter than abdomen; tips of digits lighter, contrasting with under surface of foot.

Measurements in mm.—Nos. 17146 (type), 110649, 25762, 110650, 110647, 110642; sex, ♀, ♀, ♀, ♀, ♂, ♂; snout to anterior end of vent, 70, 67, 59, 56, 52, 50; width of head, 11.5, 11, 10, 9.8, 9, 9; length of head to gular fold, 17, 15, 14.6, 13.2, 13.5, 12.5; snout to forearm, 22, 18.5, 17.8, 16.3, 16, 16; tail, 60.2, 54, 47.5, 41, 46, 46.5; axilla to groin, 41, 40.1, 35.2, 33.2, 28.8, 27.5; head length in length, 4.1 times; head width in length, 6 times; arm, 18.2, 17, 16, 13.8, 15.3, 13, 13; leg, 19.6, 18.8, 17, 15.5, 16, 14.3; maxillary-premaxillary teeth, 58-60, 48-48, 50-50, 43-44, 42-44, 40-40; vomerine teeth, 18-20, 18-18, 14-15, 16-16, 18-16, 11-12; mandibular teeth, 64-66, 45-?, 52-52, 45-45, 45-42, 41-42.

Variations.—Variation in the paratype series is largely a matter of size (age). The teeth are more numerous in older specimens. The sex differences are the actually longer limbs, shorter axilla to groin measurement in males, and the much greater subnarial swelling and fewer teeth. A submental gland is present.

Some of the specimens have the spotting obsolete, while others have the

spots on body and sides as well as on tail. Certain young specimens have the vomerine teeth irregularly placed.

The digits are flat, broad, rather rounding on the tip. If slightly dehydrated they appear to have the web continued as a fringe to the tips. The gular groove can be traced to the dorsal surface in some specimens.

Specimens captured by Mr. Roberts were found under stones above Pablillo, Galeana, N. L. Dr. Smith states, "The elevation at the Galeana locality is 5,200 ft. It was raining here when we got the salamanders, but the region has a semiarid appearance, with cactus and thorny scrubby shrubs. There is no grass."